

На практиці процес HRA найчастіше виконують поетапно, хоча іноді деякі його частини (наприклад, аналіз завдань та ідентифікацію помилок) проводять паралельно.

Вихідними даними методу є:

- перелік помилок, які можуть відбутися, і методи їх скорочення (переважно через модернізацію системи);
- види помилок, причини і наслідки типових помилок;
- якісна чи кількісна оцінка ризику розглянутих помилок.

## **THE INTRODUCTION OF URBAN FREIGHT RAIL TRANSPORT INTO DELIVERY SYSTEM**

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In recent years the problem of goods supply has been acute. Delivery system has its own limitations and shortcomings. This system is becoming obsolete due to an increase in the number of small businesses, high rates of motorization growth, restricting the movement of trucks and environmental constrains, congestion of the transport network and lack of infrastructure (access roads for trucks, loading/unloading system). Thus, it is necessary to find a new technology of supplying goods and alternative to the road. Local administration of some European countries has faced this problem and found a solution. They have begun to consider rail as the most attractive choice.

This technology is not used in Ukraine but some similar experiments have been made abroad. In several European countries rail system has been implemented to satisfy particular needs, taking into account logistics principles of different private firms. It should be said that urban rail transport system includes both trams and trains. The examples of train system use to bring goods to the distribution centers may be witnessed in some countries including France (Paris), Italia (Rome), Germany (Berlin) and Japan (Kawasaki).

In particular, in France the scheme of supplying goods to Monoprix (a large French supermarket chain) by rail has been developed by SAMADA. Goods are carried by rail from two warehouses to Monoprix stores in Paris. Monoprix stores is the only users and consumers of this scheme.

In addition, it should be described countries which use tram system should be described. These are Germany (Dresden), Switzerland (Zürich) and Holland (Amsterdam).

In Dresden, for instance, the tram service, called CarGo Tram, has

been developed by Volkswagen for carrying goods from a factory to logistic center.

The use of urban rail system as an alternative to the road has a lot of benefits. First of all, rail is an ecological transport. Secondly, the use of rail transport can help to decrease traffic congestion by reducing the number of vehicles. Moreover, the capacity of rail transport allows to carry a large amount of freight.

Turning to the other side of the subject, the use of urban rail system to carry goods also has some drawbacks:

- it is necessary to make transport infrastructure conducive for freight rail transportation (the need of outer and inner terminals, depot and organize loading/unloading operations).

- rail freight service will become compete with passenger services for line capacity in a single route.

- rail infrastructure and related systems' costs can be high.

To sum up, urban freight rail system can be considered as alternative to the road and may be used in cities where rail system exists (as an option metropolitan, tram). Some big Ukrainian cities such as: Kyiv, Kharkov and Dnipro have a well-developed rail infrastructure. So, urban rail system can be introduced into delivery system of Ukrainian cities. Thought, before the start of scheme implementation, it is necessary to determine: markets which would be interested to use rail service, suitable accessible itineraries and equipment, operational and technical capability, economic efficiency and influence on the passenger services. As soon as these aspects have been considered and investigated, its possible implementation may be examined.

## **УПРАВЛІННЯ ТРАНСПОРТНИМИ СИСТЕМАМИ ПЕРЕВЕЗЕННЯ ВАНТАЖІВ У МІСТАХ З ВИКОРИСТАННЯМ НАВІГАЦІЙНИХ МЕТОДІВ**

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В даний час транспорт відіграє важливу роль у благоустрої міста в цілому. Автомобільні вантажні перевезення є найбільш зручними у межах міста та у міжміських сполученнях та користуються великим попитом у перевізників.

Головним завданням автомобільного вантажного транспорту є своєчасне, безпечне та найбільш вигідніше перевезення окремих вантажів. Для того, щоб перевезення вантажів було рентабельним та прибутковим необхідно складати раціональні маршрути та враховувати усі фактори, котрі можуть впливати на маршрут. Системи навігаційно-